CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY

Name(s)
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Project Number
J1605

Project Title
Bacteria vs. Turmeric: Does Turmeric Have Anti-bacterial Effects?

Abstract

Objectives/Goals
Antibiotic resistance is a big problem and there is a great need for new antibiotics. Turmeric is a natural spice commonly used in Eastern cultures. Curcumin, the active component of turmeric, has been shown to have many medicinal properties, including possibly antimicrobial activity. The goal of my project was to see if turmeric has anti-bacterial effects.

Methods/Materials
Using the scientific resources available to me, I made a pilot project using a modified Kirby- Bauer method to test my hypothesis. I made a turmeric paste using ¼ tsp. of turmeric powder and ½ tsp. of water. A petri dish with agar was swabbed with contaminated water. Then 5, small 5 mm filter discs were heat sterilized, and were dipped in the turmeric paste and placed on the agar petri dish. I made 3 such petri dishes; each with 5 discs (Trial #1, #2, #3) and I made a control dish using 5 filter discs without any turmeric. I placed the covered petri dishes in clear plastic bags and placed them in a dark, room temperature room for 6 days. The growth of the bacteria on the dishes was observed and photographed daily. On the 6th day, I measured the diameter of the zone of inhibition around each of the discs. I recorded the diameters of the zone of bacterial inhibition around each of the discs in trial and the control groups and calculated the average.

Results
There was evidence of some antibacterial effect from the turmeric in the petri dishes. The average zone of bacterial inhibition for the 3 turmeric petri dishes was 9.3mm. The control dish had no zone of inhibition. In Trial #1 there was a zone of inhibition of 10.5mm, in Trial #2 the zone of inhibition was 6.6 mm, and in Trial #3 the zone of inhibition was 10mm.

Conclusions/Discussion
My hypothesis was supported by my experiment; there was antibacterial effect of turmeric in a petri dish, with an average zone of inhibition of 9.3mm. The zone of inhibition may have been smaller than those of typical antibiotics (15-20mm) because the turmeric was tested against a mixture of bacteria, using home-based equipment. The concentration of turmeric may need to be different for more antibacterial effect. This pilot project will lead to further testing of turmeric in a more scientifically rigorous setting, using specific bacteria and different concentrations of turmeric. If further antibacterial activity is confirmed, then research into curcumin as an antibiotic may be warranted.

Summary Statement
The goal of my project is to determine if turmeric has anti-bacterial effects in a petri dish.

Help Received
My mother helped me with the poster; my father helped me with the safety aspects with the experiment.